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UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

Project | Date | Author

TITLE

BLACK HILLS BEETLE INFESTATION IN PONDEROSA PINE,
ROOSEVELT NATIONAL FOREST,
1945

By

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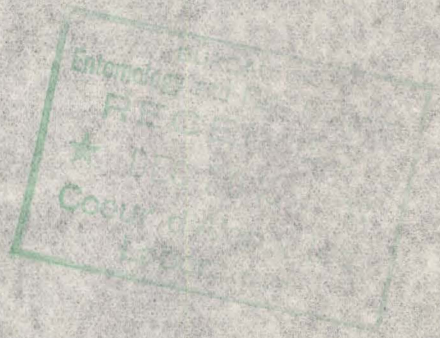
UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Administration
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

308 Agric. Bldg., Colo. A & M
Fort Collins, Colorado
December 11, 1946



Regional Forester
U. S. Forest Service
Post Office Bldg.
Denver 2, Colorado

Dear Sir:

Enclosed are two copies of a report entitled "Black Hills Beetle Infestation in Ponderosa Pine, Roosevelt National Forest, 1946." This report shows the results of a survey that has just been completed.

Control measures are recommended for six areas covering over 100,000 acres and having an estimated 32,850 infested trees. These recommendations are based on the entomological aspects of the problem. If control measures are not undertaken we feel that heavier losses will occur. From this standpoint we have little choice than to make these recommendations. As to whether control measures can be undertaken or are economically feasible is another question.

You will note that there is a recommendation made that a mobile crew be employed late in the spring (about May 15 to July 1) to clean up groups of scattered trees in the area controlled last spring. If it should not prove possible to institute the project on a large scale, priority should then be given to cleaning up the small groups of these scattered trees and to work on the reinfestation in the Fourmile area so that we may hold what we have gained during our recent control projects.

I regret that Dr. Wygant has not had an opportunity to reveiw this report. However, I discussed the matter with him before he left. I am sure he would be in agreement with the recommendations.

We are sending a copy of this report directly to the Roosevelt Forest.

Sincerely yours,

T. T. Terrell

cc: Roosevelt Forest (1)
Region 2 (2)
Craighead (2)
Circulate West

BLACK HILLS BEETLE INFESTATION IN PONDEROSA PINE, ROOSEVELT NATIONAL FOREST 1946

A survey of nearly 170,000 acres in the Ponderosa pine stands of the Roosevelt National Forest to determine the status of the Black Hills beetle infestation has been completed. The survey was made under the direction of this Bureau by a 3 man crew in the employee of the Forest Service. During the survey a fairly thorough coverage was made of the areas indicated on the enclosed map except those north of the Poudre River. The heavy snow storm of November made the sampling of these areas very difficult and less through than planned.

During the survey, 2554 acres of sample strip were taken giving a survey of 1½ percent. This is less than is desirable for a minimum of accuracy. However, in some of the more important areas - Stove Prairie, Rist Canyon and the South Fork of Lone Pine, 2 percent of the area was sampled. Because of the low percentage of coverage and of the lack of data from areas made inaccessible by snow, the writer has drawn heavily on experience and from observations of all the areas made before the storm, for some of these estimates. Revision of the field data were made only in areas 7 to 10 and such alterations were slightly downward from that obtained.

The following table will show the acreage of the areas surveyed, the estimated infestation, and a column of comparative infestation for 1945. The 1945 infestation was counted as red tops on the sample strips.

Black Hills Beetle Infestation in Ponderosa Pine,
Roosevelt National Forest
1946

Area	Acerage	Infested Trees Per Acre 1945	Infested Trees Per Acre 1946	Inf. Trees on area 1946
1 - Nederland - Sugar Loaf	7850	.38	.08	628
2 - Fourmile drainage	4100	.83	.23	943
3 - Lefthand drainage	2500	.21	.12	300
4 - Little Thompson River	1600	1.33	.67	1072
5 - Buckhorn drainage	24000	.08	.06	1440
6 - Stove Prairie - Rist Canyon	63000	.13	.26	16380
7 - Livermore - Greyrock	7000	.13	.20	1400
8 - Elkhorn - Gordon Creek	17200	.23	.30	5100
9 - S. Fork Lone Pine drainage	12400	.24	.50	6200
10 - Lone Pine - Cherokee Park	27000	.10	.15	4000
Total	166650	.178	.225	37463

An examination of this table is apt to cause alarm over the number of infested trees on the forest. The condition of some of these areas warrants alarm because the infestation is most certainly seriously epidemic. These areas are

by number, 6, 7, 8, and 9. Area no. 4 will be mentioned later.

Together, these areas total 99,600 acres of area and have an estimated 29,000 infested trees. On a tree per acre basis this is .29 for 1946 as against .16 for 1945, an increase of 81 percent.

It might be well here to point out that the ponderosa pine stands on the forest have probably always been infested with the Black Hills beetle as a normal thing and that observations and surveys have been made and control measures have been undertaken against this insect many times in past years. A summary of past work was given in a survey report for 1945.(1)

Some question might be raised as to the effectiveness of past control measures. Any appraisal of the results obtained from control measures must take into consideration the insects themselves and the conditions under which they develop. As stated before, the Black Hills beetle is a native insect. It's natural habitat is in pine stands where it maintains a normal population. Much abuse has been made of the term, normal infestation. Perhaps it would be better to say that there is always an infestation in the stands and that it is either endemic or epidemic. The endemic infestation that maintains a foothold on the Roosevelt Forest is believed, by the writer, to be greater than is ordinarily suspected - perhaps as many as 10,000 stems annually. It is doubtful if such an infestation is ever entirely static for any length of time but is either increasing or decreasing. During periods of increase, such as exists at this time, control measures are effective in preventing wide spread losses that may occur unless checked. To eliminate the insects from the stands seems impossible.

The present infestation in the areas mentioned is highly epidemic. The broods within the infested trees are heavy, and the attacks often occur in large groups. Groups of 40 infested trees were encountered. While the infested tree per acre figure given in the table varies from .20 to .50 this is but the average for the whole area. The infestation varies in intensity from about .1 to as much as 1.5 infested trees per acre within the areas.

From an entomological standpoint control measures are recommended for these areas and in addition further work should be done in the Little Thompson River area where a "hot spot" was treated last spring. It is also recommended that control measures be taken in the area shown as 2A in the Fourmile drainage. This area covers 1100 acres and is estimated to have 700 of the 943 infested trees estimated for the Fourmile area. If control measures are undertaken it should be advisable to treat with a mobile crew small areas of infestation other than those listed. These areas are found throughout the forest and will be easier to find late in the spring. This would include a clean-up of small spots on the areas treated last spring, approximately 50 infested trees near the Riverside Lodge on the South St. Vrain drainage and several groups of infested trees near Cherokee Park.

We have then the following areas where control is deemed advisable.

	Acreage	Infested Trees
Fourmile drainage	1100	700
Little Thompson	1600	1072
Stove Prairie	63000	16380
Livermore-Greyrock	7000	1400
Elkhorn-Gordon Cr.	17200	5100
S. Fk. Lone Pine Cr.	12400	6200
Miscellaneous		2000
	102300	32852

It will be noted that these recommendations are made from an entomological standpoint. If no control measures are taken to check the infestation it is believed that further increases will occur during the next few years. Recommendations on the basis of values at stake will have to rest with Forest Officers who are better able to judge these values.

To undertake control measures in the ponderosa pine of the Roosevelt National Forest would be far from easy. The area lies along the foothills of the Rocky Mountains and is very rough and rocky. Two photographs included show typical areas and give a good example of the type.

Conditions within the other areas listed are as follows:

1 - Nederland-Sugar Loaf

Control measures undertaken in this area during the past two years have been instrumental in reducing the infestation in this area. During the spring of 1946 a part of this area was spotted by a color method. Funds were not sufficient to afford spotting crews working on a systematic basis. As a consequence, spotting was not too thorough. The missed trees were counted as red tops on the fall survey. A record of treated trees and red tops gave a ratio of 45 treated to 14 untreated which indicate that only 2 out of 3 infested trees were treated. Nevertheless, very satisfactory results were obtained as is shown by the decrease.

There are in this area occasional groups of infested trees. These trees are not too hard to locate from fading and red-topped trees. It is proposed that this area be scouted thoroughly late in the spring and these scattered groups treated.

2 - Fourmile drainage

Control measures were applied to the infestation in the Fourmile area during the spring of 1946, with satisfactory results except as indicated in the portion mentioned as 2A where control measures are again advisable.

3 - Lefthand drainage

Apparently favorable results were obtained from a very limited amount of control in this area during the spring of 1946. Scattered groups of infested trees should be searched out and treated.

4 - Little Thompson River

Control measures in this area were not completed when the project closed last spring. However, sufficient trees were treated to reduce the infestation and prevent a serious increase in the area.

5 - Buckhorn drainage

While there are occasional small groups and scattered singly infested trees in this area the infestation is not felt to be epidemic. Much of the area is of north exposure with considerable Douglas fir and lodgepole pine. Along the top of the ridge in the head of Jug Gulch, Dog Creek and Cedar Creek however, there are scattered areas of infested trees that should be treated to prevent further build-up.

10 - Lone Pine-Cherokee Park

There are scattered groups of trees in this area south of Prairie Divide and in the vicinity of Cherokee Park. Much of the area, however, is apparently uninfested. Examinations were made and some sample strips were run in the stands near Redfeather Lakes and north of Cherokee Park. No infestation was found in these areas.

To draw conclusions as to the character of the infestation on the forest is difficult because of the semi-marginal nature of the stand. It seems there is little hope of cleaning up the infestation with the expectation that it will remain in that condition. Control measures are very difficult to apply in the rough, broken terrain making a thorough clean-up next to impossible under our present methods. Apparently an annual program in which "hot spots" and the more heavily infested areas are treated each year must be instituted if widespread outbreaks are to be held in check.

Submitted by,

T. T. Terrell

PONDEROSA PINE TYPE AND TERRAIN ON
ROOSEVELT NATIONAL FOREST

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
EARLE H. CLAPP, ACTING CHIEF
T. W. NORCROSS, CHIEF, DIVISION OF ENGINEERING

ROOSEVELT NATIONAL FOREST COLORADO

SIXTH PRINCIPAL MERIDIAN

1941

Scale 1 0 1 2 3 4 5 Miles

LEGEND

- National Forest Boundary
- Adjacent National Forest Boundary
- Good Motor Road
- Poor Motor Road
- Trail
- Railroad
- Telephone line
- Supervisor's Headquarters
- District Ranger Station
- Guard or Ranger Station not permanently occupied
- Triangulation Station
- House, Cabin or Other Building
- Commercial or Municipal Field
- Sawmill
- Fire Tool Cache

Compiled at Regional Office, Denver, from U.S.G.S., G.L.O., forest Service and other surveys, by F. Flack and F.E. Washburn. Revised by F. Flack - January, 1941

Longitude west from Greenwich

Polyconic projection North American datum